WHAT IS CLAIMED IS:

1. An isolated polynucleotide, which encodes a protein comprising the amino acid sequence of SEQ ID NO:2.

2. The isolated polynucleotide of Claim 1, wherein said protein has trehalose 6-phosphate synthase activity.

3. A vector comprising the isolated polynucleotide of Claim 1.

4. A host cell comprising the isolated polynucleotide of Claim 1.

5. The host cell of Claim 4, which is a *Coryneform* bacterium.

6. The host cell of Claim 4, wherein said host cell is selected from the group consisting of *Coryneform glutamicum*, *Corynebacterium acetoglutamicum*, *Corynebacterium acetoacidophilum*, *Corynebacterium melassecola*, *Corynebacterium thermoaminogenes*, *Brevibacterium flavum*, *Brevibacterium lactofermentum*, and *Brevibacterium divaricatum*.

7. A method for detecting a nucleic acid with at least 70% homology to nucleotide of Claim 1, comprising contacting a nucleic acid sample with a probe or primer comprising at least 15 consecutive nucleotides of the nucleotide

sequence of Claim 1, or at least 15 consecutive nucleotides of the complement thereof.

8. A method for producing a nucleic acid with at least 70% homology to nucleotide of Claim 1, comprising contacting a nucleic acid sample with a primer comprising at least 15 consecutive nucleotides of the nucleotide sequence of Claim 1, or at least 15 consecutive nucleotides of the complement thereof.

9. A process for screening for polynucleotides, which encode a protein having trehalose 6-phosphate synthase activity comprising

a) hybridizing the isolated polynucleotide of Claim 1 to the polynucleotide to be screened;

b) expressing the polynucleotide to produce a protein; and

c) detecting the presence or absence of trehalose 6-phosphate synthase activity in said protein.

10. A method for making a trehalose 6-phosphate synthase protein, comprising culturing the host cell of Claim 4 for a time and under conditions suitable for expression of the trehalose 6-phosphate synthase protein; and collecting the trehalose 6-phosphate synthase protein.

11. An isolated polynucleotide, which comprises SEQ ID NO:1.

12. An isolated polynucleotide, which is complimentary to the polynucleotide of Claim 11.

13. An isolated polynucleotide, which is at least 70% identical to the polynucleotide of Claim 11.

14. An isolated polynucleotide, which is at least 80% identical to the polynucleotide of Claim 11.

15. An isolated polynucleotide, which is at least 90% identical to the polynucleotide of Claim 11.

16. An isolated polynucleotide, which comprises at least 15 consecutive nucleotides of the polynucleotide of Claim 11.

17. An isolated polynucleotide, which hybridizes under stringent conditions to the complementary polynucleotide of Claim 11; wherein said stringent conditions comprise washing in 5X SSC at a temperature from 50 to 68°C.

18. The isolated polynucleotide of Claim 11, which encodes a protein having trehalose 6-phosphate activity.

19. A vector comprising the isolated polynucleotide of Claim 11.

20. A host cell comprising the isolated polynucleotide of Claim 11.

21. The host cell of Claim 20, which is a *Coryneform* bacterium.

22. The host cell of Claim 20, wherein said host cell is selected from the group consisting of *Coryneform glutamicum, Corynebacterium acetoglutamicum, Corynebacterium acetoacidophilum, Corynebacterium melassecola, Corynebacterium thermoaminogenes, Brevibacterium flavum, Brevibacterium lactofermentum,* and *Brevibacterium divaricatum.*

23. A process for screening for polynucleotides, which encode a protein having trehalose 6-phosphate synthase activity comprising

a) hybridizing the isolated polynucleotide of Claim 11 to the polynucleotide to be screened;

b) expressing the polynucleotide to produce a protein; and

c) detecting the presence or absence of trehalose 6-phosphate synthase activity in said protein.

24. A process for screening for polynucleotides, which encode a protein having trehalose 6-phosphate synthase activity comprising

a) hybridizing the isolated polynucleotide of Claim 11 to the polynucleotide to be screened;

b) expressing the polynucleotide to produce a protein; and

c) detecting the presence or absence of trehalose 6-phosphate synthase activity in said protein

25. A method for detecting a nucleic acid with at least 70% homology to nucleotide of Claim 11, comprising contacting a nucleic acid sample with a probe or primer comprising at least 15 consecutive nucleotides of the nucleotide sequence of Claim 11, or at least 15 consecutive nucleotides of the complement thereof.

26. A method for producing a nucleic acid with at least 70% homology to nucleotide of Claim 11, comprising contacting a nucleic acid sample with a primer comprising at least 15 consecutive nucleotides of the nucleotide sequence of Claim 11, or at least 15 consecutive nucleotides of the complement thereof.

27. A method for making a trehalose 6-phosphate synthase protein, comprising

a) culturing the host cell of Claim 20 for a time and under conditions suitable for expression of the trehalose 6-phosphate synthase protein; and

b) collecting the trehalose 6-phosphate synthase protein.

28. A *Coryneform* bacterium, which comprises an attenuated *otsA* gene.

29. The *Coryneform* bacterium of Claim 28, wherein said *otsA* gene comprises the nucleotide sequence of SEQ ID NO:1.

30. The *Coryneform* bacterium of Claim 28, wherein said *otsA* gene comprises a nucleotide sequence that hybridizes under stringent conditions to a polynucleotide that is complimentary to SEQ ID NO:1, wherein said stringent conditions comprise washing in 5X SSC at a temperature of from 50 to 68°C.

31. *Corynebacterium glutamicum* DSM 14041.

32. A process for producing L-amino acids comprising culturing a bacterial cell in a medium suitable for

producing L-amino acids, wherein said bacterial cell comprises an attenuated *otsA* gene.

33. The process of Claim 32, wherein said bacterial cell is a *Coryneform* bacterium or *Brevibacterium*.

34. The process of Claim 33, wherein said bacterial cell is selected from the group consisting of *Coryneform glutamicum, Corynebacterium acetoglutamicum, Corynebacterium acetoacidophilum, Corynebacterium melassecola, Corynebacterium thermoaminogenes, Brevibacterium flavum, Brevibacterium lactofermentum,* and *Brevibacterium divaricatum*.

35. The process of Claim 32, wherein said *otsA* gene comprises the nucleotide sequence of SEQ ID NO:1.

36. The process of Claim 32, wherein said *otsA* gene comprises a nucleotide sequence that hybridizes under stringent conditions to a polynucleotide that is complimentary to SEQ ID NO:1, wherein said stringent conditions comprise washing in 5X SSC at a temperature of from 50 to 68°C.

37. The process of Claim 32, wherein said L-amino acid is L-lysine.

38. The process of Claim 32, wherein said bacteria further comprises at least one gene whose expression is enhanced, wherein said gene is selected from the group consisting of *dapA*, *gap*, *eno*, *tpl*, *pgk*, *zwf*, *pyc*, *mqo*, *lysC*, *lysE*, and *zwa 1*.

39. The process of Claim 32, wherein said bacteria further comprises at least one gene whose expression is attenuated, wherein said gene is selected from the group consisting of *pck*, *pgi*, *poxB*, *zwa2*, *fda*, *hom*, *thrB*, and *panD*.

40. An isolated polypeptide comprising the amino acid sequence of SEQ ID NO:2.

41. An isolated polypeptide, which has an amino acid sequence that is at least 90% identical to SEQ ID NO:2.

42. An isolated polynucleotide consisting essentially of SEQ ID NO:1.

43. A vector comprising the isolated polynucleotide of Claim 42.

44. A host cell comprising the isolated polynucleotide of Claim 42.

45. A method of making a trehalose 6-phosphate synthase protein, comprising culturing the host cell of Claim 44

for a time and under conditions suitable for expression of the trehalose 6-phosphate synthase protein; and collecting said trehalose 6-phosphate synthase protein.